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REMARKS

Claims 1, 3, 5-14, 16, 18-27, 29 and 31-39 as amended, remain herein. The elements of former claims 2 and 4 are incorporated into claim 1. The elements of former claims 15 and 17 are incorporated into claim 14. The elements of claims 28 and 30 are incorporated into claim 27. The claims are otherwise amended for clarity.

1. The title has been changed to "Negative Pressure Slider with Groove" in accordance with the Examiner's suggestion.

2. Claims 1, 14, and 27 were objected to under 37 CFR 1.75 as being substantial duplicates. However, claim 1 recites "a groove extending between a disk inner peripheral end toward a disk outer peripheral end", and claim 14 recites "a groove extending from a disk inner peripheral end toward and including a disk outer peripheral end", and claim 27 recites "a groove extending from a disk outer peripheral end toward and including a disk inner peripheral end." In each claim, the groove includes a different portion of the disk. Reconsideration and withdrawing of this objection are respectfully requested.

3. Claims 1, 4, 7, 11, 14, 17, 20, 24, 27, 30, 33 and 37 were rejected under 35 U.S.C. §102(b) over either Rajakumar U.S. Patent Application Publication 2003/0165031, or Chapin U.S. Patent 5,128,822.

However, claims 2, 15 and 28, were not rejected under §102(b), and their limitations are now incorporated into claims 1, 14 and 27, respectively. Accordingly, the rejection under §102(b) is moot because all elements of the amended claims are not found in either Rajakumar or Chapin. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

4. Claims 2, 3, 15, 16, 28 and 29 were rejected under 35 U.S.C. §103(a) over Chapin.

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As noted above, Chapin does not disclose all elements of any of applicants' amended claims.

As shown in Figs. 5d and 5f of Chapin, the air bearing surface of a slider has a leading taper 25, leading sections of rails 20 and 22, a pressure relief channel 41, a cross rail 24, and a negative pressure cavity 28, in that order, from a leading edge to a trailing edge of the slider.

The surfaces of high pressure rails 20 and 22 are along both sides of the slider, the surfaces serving as positive pressure generating surfaces. The cross rail 24 is of the same height as the high pressure rails 20 and 22, and the surface of the cross rail 24 is also a positive pressure generating surface. Pressure relief channel 41 is formed on the positive pressure generating surface. The bottom surface of pressure relief channel 41 is lower than the surfaces of the cross rail 24 and the high pressure rails 20 and 22.

The bottom surface of the negative pressure cavity 28 serves as a negative pressure generating surface in the slider. The surface of the leading taper 25 extends to the leading edge of the slider and serves as an air inflow surface. This surface of leading taper 25 gradually decreased in height toward the leading edge of the slider, as show in Chapin Figs. 1a and 1c.

As discussed above, Chapin discloses a positive pressure generating surface following the air inflow surface, which is the leading taper 25, including pressure relief channel 41. However, Chapin fails to disclose or suggest that the air inflow surface extending to the leading edge of the slider has a groove, as recited in applicants' amended claims 1, 14 and 27.

In Chapin, the leading taper 25 of the slider, that is, the air inflow surface, is chamfered and is not formed on the middle surface among substantially flat surfaces, unlike the air inflow surface

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of applicants' claims 1, 14 and 27. Chapin fails to disclose or suggest that the air inflow surface is formed on the middle surface of substantially flat surfaces.

Furthermore, the amount of air flowing under the air bearing surface varies between when the air inflow surface extending to the leading edge of the slider is chamfered, and when the air inflow surface extending to the leading edge of the slider is formed on the middle surface. The air bearing surface having different amounts of air inflow ordinarily requires different designs. In other words, different designs for the air bearing surface having different amounts of air inflow are not compatible with each other. Thus, the design technique of the air bearing surface having the leading taper 25 chamfered like the slider of Chapin cannot be used as the design for the air bearing surface having the air inflow surface formed on the middle surface of the substantially flat surfaces like the slider of applicants' claims 1, 14 and 27.

Therefore, the air bearing surface of Chapin has a leading taper 25 chamfered and a pressure relief channel 41 formed on the positive pressure generating surface following the leading taper 25. However, the air bearing surface of applicants' claims 1, 14 and 27 has the air inflow surface on the middle surface among the substantially flat surfaces and the groove. The differences between the air bearing surfaces of the present application and Chapin are not obvious to one of ordinary skill in this art.

Moreover, Chapin, col. 5, lines 36-42, discloses that "the negative pressure cavity 28 need not be a constant depth. The cavity depth may be stepped or tapered to alter the negative pressure characteristics. These are variables the designer can manipulate for a specific application to provide custom flying performance." Chapin, col. 10, lines 39-45, also discloses that "the designer will appreciate that the described isolation channels 30 and 32, anterior pressure relief channel 41,

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leading edge tapers 25, 27, spoiler channels 31, cavity dividers 36, and other particulars herein described, may be selectively combined in other ways to produce a NPAB slider having optimum properties for a given application."

As discussed above, Chapin discloses that the cavity depth may be stepped or tapered to alter the negative pressure characteristics, and that the isolation channels 30, 32 etc. may be selectively combined. However, as discussed above, Chapin fails to disclose that the air inflow surface is formed on the middle surface among substantially flat surfaces, and has a groove, as recited in applicants' claims 1, 14 and 27. Thus, even if the cavity depth is stepped or tapered, or the isolation channels 30, 32 etc. are selectively combined, the air bearing surface according to applicants' claims 1, 14 and 27 is not obvious.

Consequently, the differences between the slider of Chapin and applicants' slider according to claims 1, 14 and 27 are not obvious to one of ordinary skill in this art, even in view of the disclosures in Chapin, col. 5, lines 36-42 and col. 10, lines 39-45.

Thus, for all the foregoing reasons, there is no disclosure or teaching in Chapin which discloses or would have suggested applicants' presently claimed invention to one of ordinary skill in this art. Similarly, there is no disclosure or teaching in Chapin which would have suggested the desirability of modifying any portions of Chapin to suggest applicant's presently claimed invention. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

5. Claims 5, 9, 10, 18, 22, 23, 31, 35 and 36 were rejected under §103(a) over either Rajakumar, or Chapin.

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For the reasons discussed above herein, there is no disclosure or teaching in Chapin which would have suggested applicants' presently claimed invention to one of ordinary skill in the art.

Rajakumar Fig. 5 discloses that a slider has an island 366, a step level cross channel 360, an air bearing surface 324, and cavities 334 and 336, in that order, from a leading edge 314 to a trailing edge 316, and the island 366 and the air bearing surface 324, the step level cross channel 360, and cavities 334 and 336, respectively, are formed on an upper stage surface, a middle surface, and a lower stage surface.

Further, as shown in Rajakumar Fig. 7 the slider has an island 472, a cavity level cross channel 470, an air bearing surface 324, and cavities 334 and 336, in that order, from the leading edge 314 to the trailing edge 316, and the island 472 and the air bearing surface 324 are formed on the upper stage surface, the cavity level cross channel 470 is formed on the lower stage surface, and the cavities 334 and 336 are formed on the lower stage surface.

Rajakumar fails to disclose an air bearing surface has three stages comprising an air inflow surface, a positive pressure generating surface and a negative pressure generating surface, respectively, in that order, from an air flow incoming end to an air flow outgoing end of a slider, the positive pressure generating surface, the air inflow surface and the negative pressure generating surface are respectively formed on the upper stage surface, the middle surface and the lower stage surface, and the air inflow surface formed on the middle surface extending to the air flow incoming end has a groove, as recited in applicants' claims.

Thus, for all the foregoing reasons, there is no disclosure or teaching in either Rajakumar or Chapin which would have disclosed or suggested applicants' presently claimed invention to one of ordinary skill in this art. Similarly, there is no disclosure or teaching in either of those

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references of any suggestion to modify the disclosure thereof to effectively anticipate or suggest applicants' presently claimed invention. Accordingly, reconsideration and withdrawal of these grounds of rejection are respectfully requested.

6. Claims 6, 12, 13, 19, 25, 26, 32, 28 and 39 were rejected under §103 over Rajakumar or Chapin further in view of applicants' admitted prior art.

For the reasons discussed above herein, there is no disclosure or teaching in either Rajakumar or Chapin which would have suggested applicants' presently claimed invention to one of ordinary skill in this art. Neither of those references discloses all elements of applicants' presently claimed invention. And, the AAPA does not fill the deficiencies in Rajakumar or Chapin. Thus, there is no disclosure or teaching in any of Rajakumar, Chapin or the AAPA which would have suggested applicants' presently claimed invention. Nor is there any disclosure or teaching in any of those references which would have suggested the desirability of combining or modifying any portions thereof effectively to suggest or render obvious applicants' presently claimed invention. Accordingly, reconsideration and withdrawal of these grounds for rejection are respectfully requested.

7. Claims 8, 21 and 34 were rejected under §103(a) over Rajakumar review of Mundt.

For the reasons discussed above herein, there is no disclosure or teaching in Rajakumar which would have suggested applicants' presently claimed invention to one of ordinary skill in this art. And, Mundt does not provide disclosure which would fill the deficiencies in the Rajakumar disclosure. There is no disclosure or teaching in either Rajakumar or Mundt which suggest applicants' presently claimed invention. And, there is no disclosure or teaching in either of those references, or anything else in this record which would have suggested the desirability of

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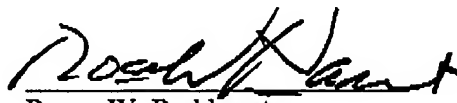
combining or modifying any portions thereof effectively to anticipate or render obvious applicants' claimed invention. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

Accordingly, all claims 1, 3, 5-14, 16, 18-27, 29 and 31-39 are now fully in condition for allowance and a notice to that effect is respectfully requested. The PTO is hereby authorized to charge/credit any fee deficiencies or overpayments to Deposit Account No. 19-4293. If further amendments would place this application in even better condition for issue, the Examiner is invited to call Applicants' undersigned attorney at the number listed below.

Respectfully submitted,

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